

## Intellectual Property Published by Sandia Scientists

This section presents intellectual property claims (US patents, US patent applications, and WIPO applications) published by Sandia scientists in the area of solid-state lighting from 1992 through July 2003. The citations are organized by year, beginning with the most recent year. Within years, publications are ordered sequentially by publication number. To skip directly to a particular year, click on the link, below.

Select a year:

<a href="#">2003</a>	<a href="#">2002</a>	<a href="#">2001</a>	<a href="#">2000</a>
<a href="#">1999</a>	<a href="#">1998</a>	<a href="#">1997</a>	<a href="#">1996</a>
<a href="#">1995</a>	<a href="#">1994</a>	<a href="#">1993</a>	<a href="#">1992</a>

### 2003

#### **US6504859: Light sources based on semiconductor current filaments**

**Assignee:** Sandia Corporation

**Inventor(s):** F.J. Zutavern , G.M. Loubriel, M.T. Buttram, A. Mar, W.D. Helgeson, M.W. O'Malley, H.P. Hjalmarson, A.G. Baca, W.W. Chow, and G.A. Vawter

**Publication Date:** January 7, 2003

#### **US6599362: Cantilever epitaxial process**

**Assignee:** Sandia Corporation

**Inventor(s):** C.I. Ashby, D.M. Follstaedt, C.C. Mitchell, and J. Han

**Publication Date:** July 29, 2003

#### **US6611085: Photonically engineered incandescent emitter**

**Assignee:** Sandia Corporation

**Inventor(s):** J.M. Gee, S.-Y. Lin, J.G. Fleming, and J.B. Moreno

**Publication Date:** August 26, 2003

#### **WO3019680A1: Photonically engineered incandescent emitter**

**Assignee:** Sandia Corporation

**Inventor(s):** J.M. Gee, S.-Y. Lin, J.G. Fleming, and J.B. Moreno

**Publication Date:** March 6, 2003

### 2002

#### **US6337384: Method of making thermally removable epoxies**

**Assignee:** Sandia Corporation

**Inventor(s):** D.A. Loy, D.R. Wheeler, E.M. Russick, J.R. McElhanon, and R.S. Saunders

**Publication Date:** January 8, 2002

#### **US6358854: Method to fabricate layered material compositions**

**Assignee:** Sandia Corporation

**Inventor(s):** J.G. Fleming and S.-Y. Lin

**Publication Date:** March 19, 2002

#### **US6383402: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation  
**Inventor(s):** Jr.M.L. Smith, P.D.P. Ward, and J.O. Stevenson  
**Publication Date:** May 7, 2002

**US6384473: Microelectronic device package with an integral window**

**Assignee:** Sandia Corporation  
**Inventor(s):** K.A. Peterson and R.D. Watson  
**Publication Date:** May 7, 2002

**US6393038: Frequency-doubled vertical-external-cavity surface-emitting laser**

**Assignee:** Sandia Corporation  
**Inventor(s):** T.D. Raymond, W.J. Alford, M.H. Crawford, and A.A. Allerman  
**Publication Date:** May 21, 2002

**US6406931: Structural tuning of residual conductivity in highly mismatched III-V layers**

**Assignee:** Sandia Corporation  
**Inventor(s):** J. Han and J.J. Figiel  
**Publication Date:** June 18, 2002

**US6419801: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation  
**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward  
**Publication Date:** July 16, 2002

**US6458263: Cantilevered multilevel LIGA devices and methods**

**Assignee:** Sandia National Laboratories  
**Inventor(s):** A.M. Morales and L.A. Domeier  
**Publication Date:** October 1, 2002

**US6489670: Sealed symmetric multilayered microelectronic device package with integral windows**

**Assignee:** Sandia Corporation  
**Inventor(s):** K.A. Peterson and R.D. Watson  
**Publication Date:** December 3, 2002

**US6495895: Bi-level multilayered microelectronic device package with an integral window**

**Assignee:** Sandia Corporation  
**Inventor(s):** K.A. Peterson and R.D. Watson  
**Publication Date:** December 17, 2002

## 2001

**US6169933: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** January 2, 2001

**US6192826: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** February 27, 2001

**US6221679: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** April 24, 2001

**US6223755: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** May 1, 2001

**US6228672: Stable surface passivation process for compound semiconductors**

**Assignee:** Sandia Corporation

**Inventor(s):** C.I.H. Ashby

**Publication Date:** May 8, 2001

**US6229947: Tapered rib fiber coupler for semiconductor optical devices**

**Assignee:** Sandia Corporation

**Inventor(s):** G.A. Vawter and R.E. Smith

**Publication Date:** May 8, 2001

**US6232139: Method of making suspended thin-film semiconductor piezoelectric devices**

**Assignee:** Sandia Corporation

**Inventor(s):** S.A. Casalnuovo and G.C. Frye-Mason

**Publication Date:** May 15, 2001

**US6235864: Non-strinking siloxane polymers**

**Assignee:** Sandia Corporation

**Inventor(s):** D.A. Loy and K. Rahimian

**Publication Date:** May 22, 2001

**US6246473: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** June 12, 2001

**US6252287: InGaAsN/GaAs heterojunction for multi-junction solar cells**

**Assignee:** Sandia Corporation

**Inventor(s):** S.R. Kurtz, A.A. Allerman, J.F. Klem, and E.D. Jones

**Publication Date:** June 26, 2001

**US6254717: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** July 3, 2001

**US6258615: Method of varying a characteristic of an optical vertical cavity structure formed by metalorganic vapor phase epitaxy**

**Assignee:** Sandia Corporation

**Inventor(s):** H.Q. Hou, M.E. Coltrin, and K.D. Choquette

**Publication Date:** July 10, 2001

**US6261470: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** July 17, 2001

**US6269278: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** July 31, 2001

**US6271335: Method of making thermally removable polymeric encapsulants**

**Assignee:** Sandia Corporation

**Inventor(s):** J.H. Small, D.A. Loy, D.R. Wheeler, J.R. McElhanon, and R.S. Saunders

**Publication Date:** August 7, 2001

**US6275740: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** August 14, 2001

**US6329296: Metal catalyst technique for texturing silicon solar cells**

**Assignee:** Sandia Corporation

**Inventor(s):** D.S. Ruby and S.H. Zaidi

**Publication Date:** December 11, 2001

**USRE37100: Pulsed ion beam source**

**Assignee:** Sandia Corporation

**Inventor(s):** J.B. Greenly

**Publication Date:** March 20, 2001

**WO0193387A2: Long wavelength vertical cavity surface emitting laser**

**Assignee:** Sandia Corporation

**Inventor(s):** K.D. Choquette, J.F.C.K.D. Klem, and J.F. KLEM

**Publication Date:** December 6, 2001

## 2000

**Publication Date:** December 6, 2001

**US6077386: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** June 20, 2000

**US6090302: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** July 18, 2000

**US6093246: Photonic crystal devices formed by a charged-particle beam**

**Assignee:** Sandia Corporation

**Inventor(s):** S.-Y. Lin and H.W.P. Koops

**Publication Date:** July 25, 2000

**US6103305: Method of forming a stress relieved amorphous tetrahedrally-coordinated carbon film**

**Assignee:** Sandia Corporation

**Inventor(s):** T.A. Friedmann and J.P. Sullivan

**Publication Date:** August 15, 2000

**US6123983: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** September 26, 2000

**US6132577: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** October 17, 2000

**US6134005: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** October 17, 2000

**US6157447: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** December 5, 2000

**US6165312: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.M.L. Smith, J.O. Stevenson, and P.P.D. Ward

**Publication Date:** December 26, 2000

## 1999

**US5858559: Method for altering the luminescence of a semiconductor**

**Assignee:** Sandia Corporation

**Inventor(s):** J.C. Barbour and D.B. Dimos

**Publication Date:** January 12, 1999

**US5912738: Measurement of the curvature of a surface using parallel light beams**

**Assignee:** Sandia Corporation

**Inventor(s):** E.H. Chason, J.A. Floro, C.H. Seager, and M.B. Sinclair

**Publication Date:** June 15, 1999

**US5916634: Chemical vapor deposition of W-Si-N and W-B-N**

**Assignee:** Sandia Corporation

**Inventor(s):** J.G. Fleming, E.L. Roherty-Osmun, P.M. Smith, J.S. Custer, R.V. Jones, M.-A. Nicolet, R. Madar, and C. Bernard

**Publication Date:** June 29, 1999

**US5995529: Infrared light sources with semimetal electron injection**

**Assignee:** Sandia Corporation

**Inventor(s):** S.R. Kurtz, R.M. Biefeld, and A.A. Allerman

**Publication Date:** November 30, 1999

**US5997949: Synthesis of W-Si-N films by chemical vapor deposition using WF.sub.6, SiH.sub.4 and NH.sub.3**

**Assignee:** California Institute of Technology and Sandia Corporation

**Inventor(s):** M.-A. Nicolet, R. Madar, C. Bernard, J.G. Fleming, E.L. Roherty-Osmun, P.M. Smith, J.S. Custer, and R.V. Jones

**Publication Date:** December 7, 1999

**US5998298: Use of chemical-mechanical polishing for fabricating photonic bandgap structures**

**Assignee:** Sandia Corporation

**Inventor(s):** J.G. Fleming, S.-Y. Lin, D.L. Hetherington, and B.K. Smith

**Publication Date:** December 7, 1999

**WO9954694A1: Method and apparatus for monitoring plasma processing operations**

**Assignee:** Sandia Corporation

**Inventor(s):** M.L. Smith Jr., J.O. Stevenson, and P.D.P. Ward

**Publication Date:** October 28, 1999

## 1998

**US5712865: Temperature-insensitive vertical-cavity surface-emitting lasers and method for fabrication thereof**

**Assignee:** Sandia Corporation

**Inventor(s):** W.W. Chow, K.D. Choquette, and P.L. Gourley

**Publication Date:** January 27, 1998

**US5726462: Semiconductor structures having electrically insulating and conducting portions formed from an AlSb-alloy layer**

**Assignee:** Sandia Corporation

**Inventor(s):** O.B. Spahn and K.L. Lear

**Publication Date:** March 10, 1998

**US5780867: Broadband light-emitting diode**

**Assignee:** Sandia Corporation

**Inventor(s):** I.J. Fritz, J.F. Klem, and M.J. Hafich

**Publication Date:** July 14, 1998

**US5783340: Method for photolithographic definition of recessed features on a semiconductor wafer utilizing auto-focusing alignment**

**Assignee:** Sandia Corporation

**Inventor(s):** A.J. Farino, S. Montague, J.J. Sniegowski, J.H. Smith, and P.J. McWhorter

**Publication Date:** July 21, 1998

**US5814238: Method for dry etching of transition metals**

**Assignee:** Sandia Corporation

**Inventor(s):** C.I.H. Ashby, A.G. Baca, P. Esherick, J.E. Parmeter, D.J. Rieger, and R.J. Shul

**Publication Date:** September 29, 1998

**US5814245: Fluorescent and cathodoluminescent phosphors structurally related to sodalite**

**Assignee:** Sandia Corporation

**Inventor(s):** M.L.F. Phillips and L.E. Shea

**Publication Date:** September 29, 1998

**US5825049: Resonant tunneling device with two-dimensional quantum well emitter and base layers**

**Assignee:** Sandia Corporation

**Inventor(s):** J.A. Simmons, M.E. Sherwin, T.J. Drummond, and M.V. Weckwerth

**Publication Date:** October 20, 1998

**US5840373: Method of growing films by flame synthesis using a stagnation-flow reactor**

**Assignee:** Sandia Corporation

**Inventor(s):** D.W. Hahn and C.F. Edwards

**Publication Date:** November 24, 1998

## 1997

**US5624529: Dry etching method for compound semiconductors**

**Assignee:** Sandia Corporation

**Inventor(s):** R.J. Shul and C. Constantine

**Publication Date:** April 29, 1997

**US5633527: Unitary lens semiconductor device**

**Assignee:** Sandia Corporation

**Inventor(s):** K.L. Lear

**Publication Date:** May 27, 1997

**US5687264: Apparatus for injecting high power laser light into a fiber optic cable**

**Assignee:** Sandia Corporation

**Inventor(s):** W.C. Sweatt

**Publication Date:** November 11, 1997

## 1996

**US5493577: Efficient semiconductor light-emitting device and method**

**Assignee:** Sandia Corporation

**Inventor(s):** K.D. Choquette, K.L. Lear, and Jr.R.P. Schneider

**Publication Date:** February 20, 1996

**US5527628: Pb-free Sn-Ag-Cu ternary eutectic solder**

**Assignee:** Iowa State University Research Foudation Inc. and Sandia Corporation

**Inventor(s):** I.E. Anderson, F.G. Yost, J.F. Smith, C.M. Miller, and R.L. Terpstra

**Publication Date:** June 18, 1996

**US5557627: Visible-wavelength semiconductor lasers and arrays**

**Assignee:** Sandia Corporation

**Inventor(s):** Jr.R.P. Schneider and M.H. Crawford

**Publication Date:** September 17, 1996

**US5557627: Visible-wavelength semiconductor lasers and arrays**

**Assignee:** Sandia Corporation

**Inventor(s):** R.P. Schneider Jr. and M.H. Crawford

**Publication Date:** September 17, 1996



## 1995

**US5428634: Visible light emitting vertical cavity surface emitting lasers**

**Assignee:** The United States of America as represented by the United States Department of Energy

**Inventor(s):** R.P. Bryan, G.R. Olbright, J.A. Lott, and R.P. Schneider Jr.

**Publication Date:** June 27, 1995

**US5463649: Monolithically integrated solid state laser and waveguide using spin-on glass**

**Assignee:** Sandia Corporation

**Inventor(s):** C.I.H. Ashby, J.P. Hohimer, D.R. Neal, and G.A. Vawter

**Publication Date:** October 31, 1995

**US5473475: Method for changing the cross section of a laser beam**

**Assignee:** The United States of America as represented by the United States Department of Energy

**Inventor(s):** W.C. Sweatt and L. Seppala

**Publication Date:** December 5, 1995

## 1994

**US5313485: Luminescent light source for laser pumping and laser system containing same**

**Assignee:** Sandia Corporation

**Inventor(s):** R.A. Hamil, C.S. Ashley, C.J. Brinker, S. Reed, and R.J. Walko

**Publication Date:** May 17, 1994

**US5351256: Electrically injected visible vertical cavity surface emitting laser diodes**

**Assignee:** The United States of America as represented by the United States Department of Energy

**Inventor(s):** R.P. Schneider and J.A. Lott

**Publication Date:** September 27, 1994

**US5356516: Process for etching mixed metal oxides**

**Assignee:** Sandia Corporation

**Inventor(s):** C.I.H. Ashby and D.S. Ginley

**Publication Date:** October 18, 1994

## 1993

**US5258990: Visible light surface emitting semiconductor laser**

**Assignee:** The United States of America as represented by the Secretary of the United States Department of Energy

**Inventor(s):** G.R. Olbright and J.L. Jewell

**Publication Date:** November 2, 1993

## 1992

**US5122305: Solid-state radiation-emitting compositions and devices**

**Assignee:** [Not Assigned]

**Inventor(s):** C.S. Ashley, C.J. Brinker, S. Reed, T.J. Shepodd, L.E. Leonard, R.E. Ellefson, J.T. Gill, R.J. Walko, and C.L. Renschler

**Publication Date:** June 16, 1992